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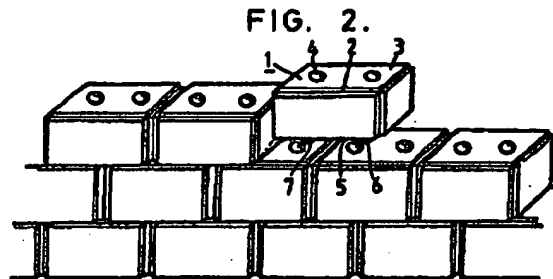
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## (54) Manufacture of a building element

(57) A rectangular building block (1) is moulded under pressure from a mixture of sawdust and/or grain grain husks with an adhesive agent. The block may be moulded with spigots (6) and sockets (4) to enable interconnection with similar blocks, and with edge grooves (2).



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FIG. 1.

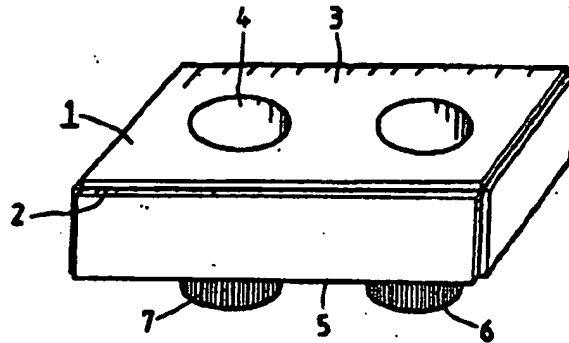


FIG. 2.

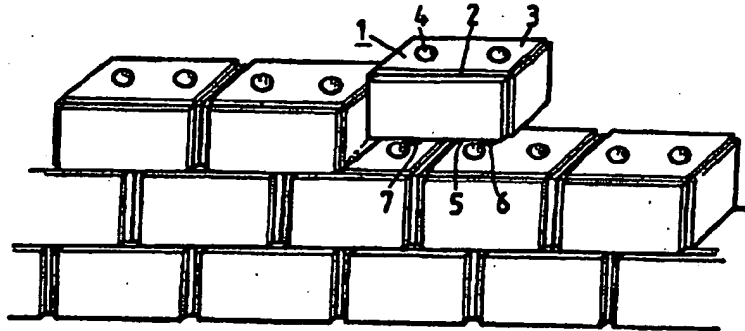
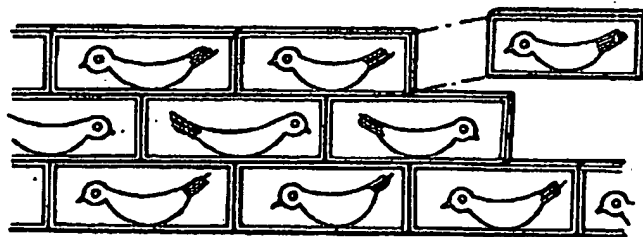


FIG. 3.



## SPECIFICATION

## Manufacture of a building element

- 5 Wood is a very effective building material because it is soft to the touch, easily formed to the desired shape and size, and may be readily connected to wood and other materials. However, wood is expensive and is liable to damage when subjected to moisture, shock, or infestation such as by mice or woodworm. Wood is also subject to warping and this is unsightly and unsatisfactory when used, particularly for interior structures such as doors. Furthermore, when exposed, wood has to be specially selected to take account of the grain and any knots.

- The object of the invention is to provide for the manufacture of blocks, plates or other building elements which have properties similar to, and may be used instead of, natural wood, from sawdust and/or husks of grain, such as rice, barley or wheat, which represent a cheap source of raw material.

- In accordance with the present invention, in a method of manufacturing a building element from a material comprising sawdust and/or grain husks, the material is sprayed with an adhesive agent to provide a mixture with the ratio of 1 litre of material to between 22 and 29 ml of adhesive agent when the material is sawdust, and to between 18 and 21 ml of adhesive agent when the material is grain husks, and pro rata with the proportion of sawdust and grain husks when the material comprises both sawdust and grain husks; and moulding a quantity of the mixture under pressure in a mould having the size and shape of the building element, the quantity of mixture being between 1.8 and 2.2, preferably between 2.0 and 2.2, times the mould volume (i.e. volume of the moulded element) when the material is sawdust, between 3.2 and 3.6 times the mould volume when the material is grain husks, and pro rata with the proportion of sawdust and grain husks when the material comprises sawdust and grain husks.

- When sawdust is used, it may include some wood shavings and should not have an unnaturally high moisture content. In practice it may be preferable to use a mixture of sawdust and grain husks. The resulting building elements are generally stronger, and less liable to warping or degradation than natural wood. Quasi wooden structures can readily and economically be built by unskilled labour, upon assembling a number of the elements, and, depending upon the manner of connecting the elements, the structures may be dismantled and the elements reused.

- The elements may be of any convenient shape, depending upon the mould shape, such as round or oval blocks but blocks of rectangular shape are most convenient.

- It will usually be necessary to mould the quantity of material under a pressure of between 45 and 55 Kg/cm<sup>2</sup>, preferably in a two part mould.

- The quantity of adhesive agent depends upon the proportions of sawdust and grain husks and

the larger the proportion of grain husks, the larger the volume of adhesive agent required. This is because grain husks have a larger void volume than sawdust.

- Suitable adhesive agents include synthetic high molecular compounds, such as glue, urea resin, melamine resin, puren resin, acryl emulsion and phenol resin. Glue, urea resin and melamine resin, which are water soluble, are particularly suitable. Urea resin and melamine resin are thermosetting adhesive agents and provide very good bonding for paper and textiles.

- In order to give the resulting element an attractive colour, colouring matter may be included in the mixture of material and adhesive agents.

- A flavouring agent may be included, preferably in an amount of substantially 10% by volume of the adhesive agent, in the mixture of material and adhesive agent. The resulting element will release a perfume which may be chosen as an effective deterrent against live infestation such as mice and woodworm.

- An example of a building block constructed in accordance with the present invention, and the use of two types of blocks are illustrated in the accompanying drawings in which

Figure 1 is a perspective view of one block;

Figure 2 is a perspective view showing a wall building of a number of the Figure 1 blocks; and,

- Figure 3 is a diagrammatic elevation showing a wall built of a modified block.

- The block of Figure 1 has a generally rectangular parallelepiped body 1 the largest faces 3 and 5 of which each has a length which is approximately twice its width. Cylindrical sockets 4 are moulded into the face 3 centered one quarter and three quarters of the way along the longitudinal centre line of the face. Complementary spigots 6 are moulded at similar positions projecting from the face 5. Each projection 6 is provided with axial serrations 7. The spigots and sockets enable a wall to be built as shown in Figure 2 so that the spigots of one block are received in sockets 4 at the ends of two blocks of the course below. The projections may of course be of different shape, e.g. of square or pentagonal section. The illustrated spigots and sockets of circular cross section have the advantage that, if the ends of the block are appropriately shaped, a curved wall may be built.

- Each edge of the block is moulded with a groove 2 of right angular cross-section. When a number of the blocks are built into a wall as shown in Figure 2, this provides between adjacent blocks double width grooves on the exposed faces of the wall. These provide a sound absorbing effect. Alternatively, strips may be inserted into the grooves either for ornamentation or, if bonded into the grooves, to provide extra strength.

- As shown in Figure 3, a face of the block may be relief moulded with an ornamental pattern, in this case a bird.

- The following examples are typical of the manufacturing method:

- Example 1. 2145ml of sawdust was mixed with, by the spraying on of, 52ml of melamine resin ad-

hesive incorporating 5ml of dark blue colouring matter. Thereafter the mixture was inserted into a two part mould and pressed under a pressure of 50 Kg/cm<sup>2</sup> to produce the block shown in Figure 1 with a size of 57 x 90 x 190mm.

*Example 2* 3412ml of rice bran was mixed with, by the spraying on of, 55ml of melamine resin adhesive. Thereafter the method was as described in example 2 to produce a block of the same size.

*Example 3* 1430ml of sawdust and 1137 ml of rice bran were mixed with, by the spraying on of, 52ml of melamine resin adhesive. The mixture was then inserted into a mould and compressed under a pressure of 52Kg/cm<sup>2</sup>. This also produced a block as shown in Figure 1 with a size of 57 x 90 x 190 mm.

*Example 4* 304ml of sawdust and 268 ml of rice bran were mixed with, by the spraying on of, 12 ml of melamine resin adhesive. The mixture was inserted into a mould and subjected to a pressure of 12Kg/cm<sup>2</sup>. The resulting rectangular block had a size of 20 x 60 x 80mm.

#### CLAIMS

1. A method of manufacturing a building element from a material comprising sawdust and/or grain husks, wherein the material is sprayed with an adhesive agent to provide a mixture with the ratio of 1 litre of material to between 22 and 28 ml of adhesive agent when the material is sawdust, and to between 16 and 21 ml of adhesive agent when the material is grain husks, and pro rata with the proportion of sawdust and grain husks when the material comprises both sawdust and grain husks; and moulding a quantity of the mixture under pressure in a mould having the size and shape of the building element, the quantity of mixture being between 1.8 and 2.2 times the mould volume when the material is sawdust, between 3.2 and 3.6 times the mould volume when the material is grain husks, and pro rata with the proportion of sawdust and grain husks when the material comprises sawdust and grain husks.
2. A method according to claim 1, wherein the quantity of material is moulded under a pressure of between 45 and 55 Kg/cm<sup>2</sup>.
3. A method according to claim 1 or claim 2, wherein the adhesive agent is selected from glue, urea resin, melamine resin, puran resin, acrylic emulsion and phenol resin.
4. A method according to any one of the preceding claims, in which colouring matter is also included in the mixture of material and adhesive agent.
5. A method according to any one of the preceding claims, in which a flavouring agent is also included in the mixture of material and adhesive agent.
6. A method according to claim 5, in which the flavouring agent is included in an amount of substantially 10% by volume of the adhesive agent.
7. A method of making a building element substantially as described in any one of the examples.
8. A building element when made by a method

according to any one of the preceding claims.

8. A rectangular block according to claim 5, and which is provided on one of its largest faces with two projecting spigots and on the other of its largest faces with two sockets each of which may receive one of the spigots on a similar block as a close fit, the spigots and sockets being centred on the longitudinal centreline of the face at positions one quarter and three quarters of the way along the centreline from one end of the block to the other.

10. A rectangular block according to claim 8 or claim 9, in which edges of the block are each provided with a groove.

11. A block substantially as described with reference to the accompanying drawings.

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